

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated September 15, 2005. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-10 and 20 are under consideration in this application. Claims 1-2 are being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention. Claim 20 is being added to recite another embodiment described in the specification.

All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formality Rejection

The Examiner objected to claim 2 for a minor formal error. As indicated, claim 2 is being amended as suggested by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejection

Claims 1 and 9 were rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 6,148,383 to Micka et al. (hereinafter "Micka"), claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Micka in view of US Pat. App. Pub. No. 2004/0267829 of Hirakawa et al. (hereinafter "Hirakawa"), and claims 3-8 and 10 were rejected over Micka. The prior art references of US Patent No. Kodem et al. (6,363,385) was cited as being pertinent to the invention. These rejections have been carefully considered, but are most respectfully traversed in view of the claims currently on file, as more fully discussed below.

As now recited in the claim 1, the data processing system of the invention (for example, the embodiment depicted in Fig. 25), comprises: a first storage system 100A communicably connected to a host unit 180; and a second storage system 100B and a third

storage system 100C each communicably connected to said first storage system 100A. (1) The first storage system 100A comprises: a first data storage area DATA1 for storing data transmitted from the host unit 180; a first journal storage area JNL1 for storing a journal used for producing a copy of data stored in said first storage area DATA1; and a first control unit which writes the data transmitted from said host unit 180 into said first data storage area DATA1, writes the journal of the data written into said first data storage area DATA1 into said first journal storage area JNL1, and transmits said journal present in said first journal storage area JNL1 to each of said second and third storage systems 100B, 100C in response to a read request from each of said second and third storage systems 100B, 100C. (2) The second storage system 100B comprises: a second data storage area COPY1 for storing a copy of the data present in said first data storage area DATA1; a second journal storage area JNL2 for storing said journal; and a second control unit which schedules a first journal read timing independently from said third storage system 100C (“the timing thereof differs between the auxiliary storage systems 100B, 100C” p. 30, lines 2-3), transmits said read request to said first storage system 100A to read said journal from said first storage system 100A at an independently scheduled first journal read timing, writes the read-out journal into said second journal storage area JNL2, produces a copy of the data present in said first data storage area DATA1 based on said journal present in said second journal storage area JNL2 at an independently scheduled restore timing, and writes the copy into said second data storage area COPY1. (3) The third storage system 100C comprises: a third data storage area COPY3 for storing a copy of the data present in said first data storage area DATA1; a third journal storage area JNL3 for storing said journal; and a third control unit which schedules a second journal read timing independently from said second storage system 100B, transmits said read request to said first storage system 100 A to read said journal from said first storage system 100A at said independently scheduled second journal read timing, writes the read-out journal into said third journal storage area JNL3, produces a copy of the data present in said first data storage area DATA1 based on said journal present in said third journal storage area JNL3 at an independently scheduled restore timing, and writes the copy into said third data storage area COPY3. The first control unit of said first storage system 100A detects as to whether or not said journal present in said first journal storage area DATA1 has been read by said second and third storage systems 100B, 100C, holds said journal present in said first journal storage area JNL1 till the journal is read by both said second and third storage systems 100B, 100C, and then deletes said journal present in said first journal storage area JNL1 after the journal

has been read by both said second and third storage systems 100B, 100C.

Applicants respectfully submit that none of the cited prior art references teaches or suggests that “the second and third storage systems schedule respective timings for reading the journal from the first storage system independently from each other” according to the invention.

First of all, contrary to the Examiner’s assertion that Micka teaches at least three storage systems: the combination of 110-113, the combination of 116-199, and the other (p. 2 , last line to p.3, line 3 of the outstanding Office Action), Micka merely teaches two storage systems with different operation timing schedule. Micka only discloses a secondary site which is connected to a primary site, but fails to disclose any other site (i.e., a third site) which is also connected to the primary site. Therefore, Micka does not disclose any a third storage system with its own timing schedule for reading the journal from the first storage system independently from those of the second storage system.

In addition, in Micka’s step 406 (col. 8, Lines 11 – 27; Fig. 4), the storage system primary site 106 receives data records and locally applies the data records to a primary site storage, and in the same step 406, the primary site 106 forwards the data records to the corresponding secondary controller in order to mirror these data records on the secondary site 108. As such, Micka’s timing for mirroring data from the primary site 106 to the secondary site 108 is not defined by the secondary site 108, but by the primary site 106. Therefore, Micka fails to disclose that the second storage system 108 schedules its timing for reading the journal from the first storage system 106.

Hirakawa was relied upon by the Examiner to teach that each of storage system comprises a host adapter for exchanging data with said first storage system, a disk adapter for exchanging data with said plurality of physical storage units, and a cache memory for storing the data received by said host adapter and the data received by said disk adapter (p. 5, last paragraph of the outstanding Office Action). However, Hirakawa’s third storage system is connected to the second storage system and reads a journal from the second storage system (claim 17; Figs. 23-24), rather than being connected to the first storage system and reading a journal from the first storage system as the invention. Therefore, Hirakawa fail to compensate for Micka’s deficiencies.

Applicants contend that Micka, Hirakawa and their combination all fail to teach or suggest each and every feature of the present invention as recited in independent claim 1. As such, the present invention as now claimed is distinguishable and thereby allowable over the

rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

Stanley P. Fisher
Registration Number 24,344



Juan Carlos A. Marquez
Registration Number 34,072

REED SMITH LLP
3110 Fairview Park Drive, Suite 1400
Falls Church, Virginia 22042
(703) 641-4200

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